

CLAIMS

1. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

- 5           (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,
- (b) the output polarizer angle  $\gamma$  is at an angle of  $135^\circ$  minus the twist angle of the said liquid crystal cell, and
- (c) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 1.1
- 10           and 1.5 microns.

2. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

- 15           (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,
- (b) the output polarizer angle  $\gamma$  is at an angle of  $135^\circ$  minus the twist angle of the said liquid crystal cell, and
- (c) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.6
- 20           and 1.0 microns.

3. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director

5 of the said liquid crystal cell,

(b) the output polarizer angle  $\gamma$  is at an angle of  $45^\circ$  minus the twist angle of the said liquid crystal cell, and

(c) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.9 and 1.3 microns.

10

4. A liquid crystal display comprising an input polarizer, a rear reflector, and a liquid crystal cell in between said input polarizer and said reflector characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director

15 of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell has a value in between  $-60^\circ$  and  $60^\circ$ , and

(c) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.45 and 0.65 microns.

20

5. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $65^\circ$  and  $85^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $20^\circ$  and  $40^\circ$  relative to the input director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 1.1 and 1.5 microns.

6. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $80^\circ$  and  $100^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 1.1 and 1.5 microns.

7. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director  
5 of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $80^\circ$  and  $100^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $-35^\circ$  and  $-55^\circ$  relative to the input  
director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.9  
10 and 1.3 microns.

8. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director  
15 of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $120^\circ$  and  $140^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $80^\circ$  and  $100^\circ$  relative to the input  
director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 1.1  
20 and 1.5 microns.

9. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director

5 of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $65^\circ$  and  $85^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $20^\circ$  and  $40^\circ$  relative to the input director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.7

10 and 0.9 microns.

10. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

15 (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $80^\circ$  and  $100^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell, and

20 (d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.7 and 0.9 microns.

11. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

(a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input  
5 director of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $80^\circ$  and  $100^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $-35^\circ$  and  $-55^\circ$  relative to the input  
director of the said liquid crystal cell, and

(d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 1.0  
10 and 1.2 microns.

12. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

15 (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,

(b) the twist angle of the said liquid crystal cell is between  $80^\circ$  and  $100^\circ$ ,

(c) the output polarizer angle  $\gamma$  is between  $35^\circ$  and  $55^\circ$  relative to the input  
director of the said liquid crystal cell, and

20 (d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.75 and 0.95 microns.

13. A liquid crystal display comprising an input polarizer, an output polarizer, and a liquid crystal cell in between said input and output polarizers characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

- 5 (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,
- (b) the twist angle of the said liquid crystal cell is between  $-5^\circ$  and  $15^\circ$ ,
- (c) the output polarizer angle  $\gamma$  is between  $-35^\circ$  and  $-55^\circ$  relative to the input director of the said liquid crystal cell, and
- 10 (d) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.9 and 1.0 microns.

14. A liquid crystal display comprising an input polarizer, a rear reflector, and a liquid crystal cell in between said input and reflector characterized by a twist angle, a cell thickness and a birefringence of the liquid crystal, such that

- 15 (a) the input polarizer angle  $\alpha$  is between  $35^\circ$  and  $55^\circ$  relative to the input director of the said liquid crystal cell,
- (b) the twist angle of the said liquid crystal cell is between  $-5^\circ$  and  $15^\circ$ , and
- (c) the product of the cell gap  $d$  and birefringence  $\Delta n$  has a value of between 0.4
- 20 and 0.8 microns.

15. A liquid crystal display as claimed in any of claims 1 to 14 wherein the input polarizer angle is  $\alpha \pm N\pi$  where  $N$  can be any positive or negative integer.

16. A liquid crystal display as claimed in any of claims 1 to 15 wherein the output  
5 polarizer angle is  $\gamma \pm N\pi$  where  $N$  can be any positive or negative integer.